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Self-locking, Self-Adjusting Receptacle, in Particular a Container

Description

The invention relates to self-locking, self-adjusting receptacles and, in particular, containers. It is, however, equally applicable to all receptacles, of any size and shaping, on the outer walls of which hollow bodies are provided for receiving locking devices. The invention will be explained in more detail below using the example of a container.

Nowadays, freight is transported worldwide mainly by using standardized containers. The containers are set down at the loading point, loaded up there, then loaded onto a vehicle (road or rail vehicle), if necessary taken to a harbor or airport where they are loaded onto a ship or into an aircraft, then locked and moored (lashed) to other containers for secure transportation, loaded onto a vehicle again at the arrival point, taken to the destination and unloaded there.

Transport logistics require both safe and quick loading and unloading of such containers, and the equipment employed must be capable of picking up containers of different dimensions, transporting them or locking them. Containers have, in their upper and lower corner regions, respective hollow bodies which possess oval openings on their outwardly directed sides. Locking devices of container spreaders or

overheight frames can be introduced into these oval openings, these locking devices having end regions (twist locks), the dimensions of which are smaller than the oval openings in the hollow bodies. As soon as the twist locks are introduced into the hollow bodies, they are mechanically twisted, so that the container is locked to the container spreader or the overheight frame and can be transported. On lifting, the upper side of the twist lock then comes to bear on the underside of the top wall of the hollow body.

It is problematic in particular when a plurality of containers stacked above and/or beside one another have to be locked together, as is necessary in particular with shiploads. In this case, the locking is carried out manually by locking together containers arranged above and/or beside one another by means of connecting and locking elements. This is time-consuming and dangerous owing to the risk of injury when attaching the connecting and locking elements.

It is known, for example from DE 100 42 458 and from DE 101 04 067, to lock together receptacles (containers) stacked above one another by means of an automatic locking system, it also being possible to transport a plurality of receptacles (containers) locked together in this way as a block.

The problem of vertical locking is thus satisfactorily solved.

It is therefore the object of the present invention to provide a receptacle which is equipped so that it can be horizontally locked to other receptacles of the same kind without manual action and at the same time occupies a defined position in relation to the adjacent containers of the same kind.

This object is achieved with the features of Claim 1. As a result, it is possible to lock together mechanically containers arranged beside and above one another, without manual action being necessary. At the same time, the container to be set down is adjusted in relation to the containers already set down, by a device in accordance with Subclaims 4 and 5, so that the container to be set down is positioned in a defined manner in relation to the adjacent containers.

The achievement of the object in accordance with Claim 1 comprises attaching to the outer sides of the containers means, for example guide rails, which engage in corresponding guide rails of adjacent containers and, because containers are set down from above downwards, bring about interengagement of the respective guide rails and in the process horizontal locking.

An essential advantage of the invention is that the hitherto customary manual locking and lashing is dispensed with and thus the risk of injury

to the workers in the harbor or on the ship is minimized. In addition, considerable savings are thereby made in terms of personnel, time and thus costs.

The means, that is to say for example the guide rails, can be U-shaped, hook-shaped or bent round. Any shape enabling interengagement of the means of adjacent containers is conceivable.

If the means, that is to say for example the guide rails, are bevelled in a manner sloping from the outside inwards in their upper and/or lower end regions, the guide rails of the respective containers have play in relation to one another, so that they can adjust by themselves in relation to one another. As a result, marshalling becomes simpler for the crane operator, since he no longer has to effect the exact positioning of the containers relative to one another from a distance from his cab, but is assisted in this by the means on the outer sides of the containers.

The invention will be explained below with the aid of some exemplary embodiments, although the subject-matter of the invention is in no way limited to these exemplary embodiments.

In the drawings,

- Fig. 1 shows a plan view of several containers horizontally locked together;
- Fig. 2 shows a perspective view of an outer locking device;
- Fig. 3 shows, in the viewing direction A, an outer locking device with bevelled corners;
- Fig. 4 shows the outer locking devices of two containers with bevelled corners during the locking procedure.

Figure 1 shows, in a detail, several containers C1, C2, C3 and C4 arranged behind and beside one another, with container corners 2 which have in their upper and lower end regions locking housings 21, so-called corner castings, with oval openings 211. The containers are locked together by outer locking devices 24. These outer locking devices 24 are of U-shaped design in this example and are open in the inner region, so that the outer locking device 24 of an adjacent container can be passed completely through the locking device. The transporting and setting-down procedure always takes place from above downwards, so that, once a container has been set down in its position, the next container is positioned from above beside the first container. During this procedure, the outer locking device of the second container can engage in the locking device of the first container, so that not only locking takes place, but the second container can also be guided and thus put exactly in its place. If a plurality of containers

below one another are being transported and if they are to be put beside a plurality of containers already stacked, the outer locking device of the lowermost container being transported can be introduced into the outer locking device of the uppermost stacked container and passed through, in order then to be introduced into the outer locking device of the next-lower stacked container, and so on. A space-saving and at the same time exact arrangement of the containers is thereby made possible.

The outer locking devices can be attached to the side parts of the containers. Advantageously, they are fastened to the container corners, as illustrated in Figure 1.

Fig. 2 shows a perspective view of an outer locking device 24 fastened to a container corner 2 or integrally connected to it. The locking device 24 is positioned at the container corner 2 such that access to the oval openings of the corner casting is not obstructed. The same applies to the corner casting in the lower end region of the container corner, not illustrated in Fig. 2.

In Fig. 3, illustrated from the viewing direction A indicated in Fig. 2, an outer locking device 24 with corners bevelled from the outside inwards can be seen. The outer locking device comprises a long leg 241, a transverse leg 242 and a short leg 243. All three legs are bevelled in a

manner sloping from the outside inwards in the region of their upper end. The short leg 243 can be additionally bevelled in the region of its part-area 243', in order to facilitate the introduction of the outer locking device 24" of the further container.

Fig. 4, finally, shows an outer locking device 24 from the perspective according to Fig. 3, in which the outer locking device 24" of a further container wishes to engage. From this perspective, only the outer wall of the transverse leg 242" can be seen. The hidden legs 241" and 243" are therefore illustrated in dashed lines. It is discernible that the short leg 243" has, in the region of its lower end, both a bevel a sloping from the outside inwards and a bevel b sloping from the inside outwards. This facilitates the sliding of the short leg 243" into the interior of the outer locking device 24, which interior is bounded by the insides of the legs 241, 242 and 243. It is discernible that the width of the short leg 243" is less than the width of the inner wall of the transverse leg 242. The short leg 243" thus has play when sliding into the outer locking device 24. As a result of the fact that the upper regions of the legs 241, 242 and 243 are bevelled in a manner sloping from the outside inwards, and that the lower end of the short leg 243" is likewise bevelled, there is enough freedom of movement, even in the rough transport business, for the outer locking device 24" to slide into the outer locking device 24.

Since the outer locking devices are made of hardened steel, for example of V2A steel, there is no fear of them being damaged when transporting the containers and during setting down or marshalling. This applies particularly when they are formed integrally or monolithically with the container corners.